

APPENDIX G: ESTIMATED COSTS FOR REMEDIATION ALTERNATIVES

Alternative 2 - Monitored Natural Attenuation

In this scenario, drums from the Drum Disposal Area will be excavated and disposed of off-site. In addition, a 10-acre cap will be installed over the Filter Cake Disposal Area. In developing this cost scenario, the following assumptions were made:

- ♦ ***19,500 55-gallon drums will be processed off-site at a RCRA permitted incinerator***
- ♦ ***12,350 55-gallon drums will be processed at an RCRA permitted landfill***

Cost Breakdown for Alternative 2

1.	On-site handling of 31,850 drums for inclusion into on-site processes and off-site disposal	31,850 drums X \$130/drum	\$ 4,140,500
2.	Off-site thermal treatment of 19,500 drums of material	19,500 drums X \$750/drum	\$14,625,000
3.	Off-site landfill disposal of 12,350 drums	12,350 drums X \$200/drum	\$2,470,000
4.	Installation of 10 acres of cap	10 acres X \$300,000	\$3,000,000
5.	Annual monitoring costs	20 years X \$100,000	\$2,000,000

Summary of Alternative 2 Cost

a) Cost of technologies as presented	\$26,235,500
b) Indirect project costs	\$11,805,975
c) Contingency(20% of total cost)	<u>\$ 7,608,295</u>
Grand Total for Alternative 2	<u>\$45,649,770</u>

Alternative 3 - Containment Based Remediation

In this scenario, the majority of impacted soils will be covered in place with some type of engineered cap. The cap system would extend over the various source areas. The only materials that would be shipped off-site in this scenario would be the drums from the Drum Disposal Area (DDA). In developing this scenario, the following assumptions were made:

- ♦ ***25 acres of land would be capped***
- ♦ ***19,500 55-gallon drums will be processed off-site at a RCRA permitted incinerator***
- ♦ ***12,350 drums will be processed off-site at a RCRA permitted landfill***
- ♦ ***45,000 square feet of vertical barrier wall will be installed to minimize the effects of perched water migration.***

Cost Breakdown for Alternative 3

1.	Installation of 25 acres of cap	25 acres X \$300,000/acre	\$7,500,000
2.	On-site handling of 31,850 drums for inclusion into on-site processes and off-site disposal	31,850 drums X \$130/drum	\$4,140,500
3.	Off-site thermal treatment of 19,500 drums of material	19,500 drums X \$750/drum	\$14,625,000
4.	Off-site landfill of 12,350 drums	12,350 drums X \$200	\$2,470,000
5.	Installation of 45,000 square feet of vertical barrier wall at selected locations to minimize the impact of perched water	45,000 SF X \$9.75/SF	\$438,750
6.	Installation of four extraction wells	4 wells X \$112,500/well	\$450,000

Summary of Alternative 3 Cost

a) Cost of technologies as presented	\$29,624,250
b) Indirect project costs	\$13,330,912
c) Contingency(20% of total cost)	<u>\$ 8,591,032</u>
Grand Total for Alternative 3	\$51,546,194

Alternative 4 - On-site Thermal Treatment Based Remediation

In this scenario, the majority of impacted soils will be handled on site via thermal treatment technologies. Materials that are not amenable to on-site processes will be shipped off-site to RCRA permitted treatment facilities. In developing this cost scenario, the following assumptions were made:

- ♦ ***150,000 cy of soil will be processed on-site via onsite thermal treatment***
- ♦ ***10,000 55-gallon drums will be processed off-site at a RCRA permitted incinerator***
- ♦ ***12,350 drums will be processed off-site at a RCRA permitted landfill***
- ♦ ***9,500 drums will be processed by on-site thermal treatment***
- ♦ ***2,000 cy of soil will be processed off-site at a RCRA permitted incinerator***
- ♦ ***Installation, operation and maintenance of an in-situ bioremediation system covering 5 acres of land area***
- ♦ ***Installation of 25 acres of cap***

Cost Breakdown for Alternative 4

1.	Excavation, transportation and backfilling of 150,000 cy of soil scheduled for thermal treatment	150,000 cy X \$22/cy	\$3,300,000
2.	On-site handling of 31,850 drums for inclusion into on-site processes and off-site disposal	31,850 drums X \$130/drum	\$ 4,140,500
3.	On-site thermal treatment of 9,500 drums	9,500 drums X \$300/drum	\$2,850,000
4.	On-site thermal treatment of 148,000 cy of soil	148,000 cy X \$135/cy	\$19,980,000
5.	Off-site thermal treatment of 10,000 drums of material	10,000 drums X \$750/drum	\$7,500,000
6.	Off-site landfill of 12,350 drums	12,350 drums X \$200/drum	\$2,470,000
7.	Off-site thermal treatment of 2,000 cy of soil	2,000 cy X \$750/cy	\$1,500,000
8.	Installation of 25 acres of cap	25 acres X \$300,000	\$7,500,000
9.	Installation, operation and maintenance of in-situ bioremediation system	5 acres X \$1,200,000	\$6,000,000
10.	Installation of 45,000 square feet of vertical barrier walls at selected locations to minimize the impact of perched water	45,000 SF X \$9.75/SF	\$438,750

Summary of Alternative 4 Cost

a) Cost of technologies as presented	\$55,679,250
b) Indirect project costs	\$25,055,662
c) Contingency(20% of total cost)	<u>\$16,146,982</u>
Grand Total for Alternative 4	\$96,881,894

Alternative 5 - On-site Bio-Treatment Based Remediation

In this scenario, the majority of impacted soils will be handled on site via bioremediation technologies. For materials that are not amenable to on-site processes will be shipped off-site to RCRA permitted treatment facilities. In developing this cost scenario, the following assumptions were made:

- ♦ ***150,000 cy of soil will be processed onsite via onsite bioremediation***
- ♦ ***11,000 55-gallon drums will be processed off-site at a RCRA permitted incinerator***
- ♦ ***12,350 drums will be landfilled***
- ♦ ***8,500 drums will be processed through on-site biotreatment***
- ♦ ***5,000 cy of soil will be processed off-site at a RCRA permitted incinerator***
- ♦ ***25 acres of cap***
- ♦ ***Installation, operation and maintenance of an in-situ bioremediation system covering 5 acres of land area***

Cost Breakdown for Alternative 5

1.	Excavation, transportation and backfilling of 150,000 cy of soil scheduled for treatment	150,000 cy X \$22/cy	\$3,300,000
2.	On-site treatment of 145,000 cy of soil	145,000 cy X \$100/cy	\$14,500,000
3.	On-site treatment of 8,500 drums of soil	8,500 drums X \$200/drum	\$1,700,000
4.	Off-site thermal treatment of 11,000 drums of material	11,000 drums X \$750/drum	\$8,250,000
5.	On-site handling of 31,850 drums for inclusion into on-site processes and off-site disposal	31,850 drums X \$130/drum	\$4,140,500
6.	Off-site thermal treatment of 5,000 cy of soil	5,000 cy X \$750/cy	\$3,500,000
7.	Off-site landfill of 12,350 drums	12,350 drums X \$200/drum	\$2,470,000
8.	Installation of 25 acres of cap	25 acres X \$300,000	\$7,500,000
9.	Installation, operation and maintenance of in-situ bioremediation system	5 acres X \$1,200,000	\$6,000,000
10.	Installation of 45,000 square feet of vertical barrier walls at selected locations to minimize the impact of perched water	45,000 SF X \$9.75 SF	\$438,750

Summary of Alternative 5 Cost

a) Cost of technologies as presented	\$51,799,250
b) Indirect project costs	\$23,309,662
c) Contingency(20% of total cost)	<u>\$15,021,782</u>
Grand Total for Alternative 5	\$90,130,694

Alternative 6 – Off-site Remediation Based Alternative

In this scenario, the majority of impacted soils will be handled off-site at a RCRA permitted landfill as well as a RCRA incinerator. In developing this cost scenario, the following assumptions were made:

- ♦ ***75,000 cy of soil will be disposed of at an off-site RCRA landfill***
- ♦ ***75,000 cy of soil will be processed at an off-site RCRA incinerator***
- ♦ ***12,350 drums will be processed at an off-site RCRA landfill***
- ♦ ***19,500 drums will be processed at an off-site RCRA incinerator***
- ♦ ***75,000 cy of import borrow will be utilized to regrade the site***
- ♦ ***25 acres of cap will be installed***
- ♦ ***Installation, operation and maintenance of an in-site bioremediation system covering 5 acres of land area***

Cost Breakdown for Alternative 6

1.	Off-site thermal treatment of 75,000 cy of soil	75,000 cy X \$750/cy	\$56,250,000
2.	Off-site landfilling of 75,000 cy of soil	75,000 cy X \$300/cy	\$22,500,000
3.	On-site handling of 31,850 drums for inclusion into on-site processes and off-site disposal	31,850 drums X \$130/drum	\$4,140,500
4.	Off-site thermal treatment of 19,500 drums	19,500 drums X \$750/drum	\$14,625,000
5.	Off-site landfill of 12,350 drums	12,350 drums X \$200/drum	\$2,470,000
6.	Installation of 25 acres of cap	25 acres X \$300,000/acre	\$7,500,000
7.	Installation of 100,000 cy of clean backfill	100,000 cy X \$15/cy	\$1,500,000
8.	Installation, operation and maintenance of one in-situ bioremediation system	5 acres X \$1,200,000/acre	\$6,000,000
9.	Installation of 45,000 square feet of vertical barrier walls at selected locations to minimize the impact of perched water	45,000 SF X \$9.75/SF	\$438,750

Summary of Alternative 6 Cost

a) Cost of technologies as presented	\$115,424,250
b) Indirect project costs	\$ 51,940,912
c) Contingency(20% of total cost)	<u>\$ 33,473,032</u>
Grand Total for Alternative 6	\$200,838,194

Alternative 7 - Combination Alternative

In this scenario, impacted materials will be treated utilizing both onsite and offsite technologies. In developing this cost scenario, the following assumptions were made:

- ♦ ***74,000 cy of soil would be processed on site utilizing on-site biotreatment***
- ♦ ***74,000 cy of soil will be processed onsite utilizing on-site thermal treatment***
- ♦ ***11,000 drums will be processed at an off-site RCRA incinerator***
- ♦ ***4,250 drums will be processed by on-site thermal treatment***
- ♦ ***4,250 drums will be processed by on-site biotreatment***
- ♦ ***11,350 drums will be landfilled***
- ♦ ***2,000 cy of soil will be processed at an off-site RCRA incinerator***
- ♦ ***Installation of 45,000 square feet of vertical barrier wall***
- ♦ ***25 acres of cap will be installed***
- ♦ ***Installation operation, and maintenance of an in-situ bioremediation system covering 5 acres***

Cost Breakdown for Alternative 7

1.	Excavation, transportation and backfilling of treated soil	148,000 cy X \$22/cy	\$3,256,000
2.	On-site handling of 31,850 drums	31,850 drums X \$130/drum	\$4,140,500
3.	On-site treatment of 74,000 cy of soil	74,000 cy X \$100/cy	\$7,400,000
4.	On-site thermal treatment of 74,000 cy of soil	74,000 cy X \$135/cy	\$10,125,000
5.	On-site thermal treatment of 4,250 drums	4,250 drums X \$300/drum	\$1,275,000
6.	On-site treatment of 4,250 drums	4,250 drums X \$200/drum	\$850,000
7.	Off-site thermal treatment of 11,000 drums of soil	11,000 drums X \$750/drum	\$8,250,000
8.	Off-site thermal treatment of 2,000 cy of soil	2,000 cy X \$750/cy	\$1,500,000
9.	Off-site landfill of 11,350 drums	11,350 drums X 200 /drum	\$2,270,000
10.	Installation of 25 acres of cap	25 acres X \$300,000	\$7,500,000
11.	Installation, operation and maintenance of in-situ bioremediation system	5 acres X \$1,200,000	\$6,000,000
12.	Installation of 45,000 square feet of vertical barrier walls at selected locations to minimize the impact of perched water	45,000 SF X \$9.75 SF	\$438,750

Summary of Alternative 7 Cost

a) Cost of technologies as presented	\$47,825,000
b) Indirect project costs	\$21,521,520
c) Contingency(20% of total cost)	<u>\$13,869,250</u>
Grand Total for Alternative 7	\$83,215,770